

1. A method of making a paper product, comprising:
providing a paper product having a paper surface and a paper
surface region treated by contact with a roughened embossing roll
to form a minority of fiber to fiber bonds broken in said paper
5 surface region to a depth less than about 0.02 mm from said paper
surface, said paper product having a majority of bonds maintained
substantially not broken in an interior region at a depth from
said paper surface of more than about 0.02 mm.

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10 2. A method of making a paper product as set forth in Claim 1,
wherein said roughened embossing roll comprises protuberances or
depressions sized at less than about 0.1 mm.

15 3. A method of making a paper product as set forth in Claim 1,
wherein said roughened embossing roll comprises protuberances or
depressions adapted to produce paper product surface deformations
in said paper surface, wherein said paper product surface defor-
mations are invisible to an unaided human eye.

20 4. A method of making a paper product as set forth in Claim 1,
wherein said paper product further comprises decorative emboss-
ing.

5. A method of making a paper product as set forth in Claim 1,
wherein said roughened embossing roll comprises pits having a
depth less than about 0.1 mm.

6. A method of making a paper product as set forth in Claim 1,
5 wherein said step of providing a paper product having a paper
surface and a paper surface region treated by contact with a
roughened embossing roll to form a minority of fiber to fiber
bonds broken in said paper surface region to a depth less than
about 0.02 mm from said paper surface forms a paper product
10 having higher perceived softness.

7. A method of making a paper product as set forth in Claim 1,
wherein said roughened embossing roll comprises channels having a
depth of less than about 0.1 mm.

15 An embossing roll for treating a paper product, comprising:
an embossing roll having a roughened surface in the form of
protuberances or depressions sized to break a minority of fiber
to fiber bonds in a paper surface region of a paper product,
wherein said protuberances or depressions are sized at less than
about 0.1 mm.

20 9. An embossing roll for treating a paper product as set forth
in Claim 8, wherein said roughened surface comprises protuber-

ances or depressions adapted to produce paper product surface deformations in said paper product, wherein said paper product surface deformations are invisible to the unaided human eye.

10. An embossing roll for treating a paper product as set forth
5 in Claim 8, wherein said roughened surface comprises protuber-
ances or depressions formed by etching or laser engraving said
embossing roll.

11. An embossing roll for treating a paper product as set forth
in Claim 8, wherein said roughened surface comprises protuber-
10 ances or depressions formed by stippling.

12. An embossing roll for treating a paper product as set forth
in Claim 10, wherein said embossing roll contains visible emboss-
ing areas for forming visible paper embossments separated by land
areas containing said protuberances or depressions for forming
15 invisible surface deformations in said paper product.

13. An embossing roll for treating a paper product as set forth
in Claim 11, wherein said embossing roll contains visible emboss-
ing areas for forming visible paper embossments separated by land
areas containing said protuberances or depressions for forming
20 invisible surface deformations in said paper product.

14. A paper product, comprising:

a paper tissue web having a paper surface and a paper surface region treated by contact with a roughened embossing roll to form a minority of fiber to fiber bonds broken in said paper surface region to a depth less than about 0.02 mm, said paper tissue web having fiber to fiber bonds maintained substantially not broken in an interior region at a depth from said paper surface of more than about 0.02 mm.

15. A paper product as set forth in Claim 14, wherein said

roughened embossing roll comprises protuberances or depressions sized at less than about 0.1 mm.

16. A paper product as set forth in Claim 14, wherein said paper product comprises paper product surface deformations are invisible to the unaided human eye formed by said roughened embossing roll protuberances or depressions.

17. A paper product as set forth in Claim 14, wherein said paper product further comprises decorative embossing.

18. A paper product as set forth in Claim 16, wherein said roughened embossing roll comprises etched protuberances or depressions having a height or depth less than about 0.1 mm.

19. A paper product as set forth in Claim 14, wherein said paper tissue web having a paper surface region treated by contact with said roughened embossing roll exhibits higher perceived softness while maintaining substantially similar levels of tensile
5 strength.

20. A paper product as set forth in Claim 14, wherein said roughened embossing roll comprises channels having a depth of less than about 0.1 mm.

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